CLAIMS

What is claimed is:

1. A system for selectively depositing a material on a previously formed workpiece, comprising:

a platform for supporting the workpiece during a deposition process;

a sensing system for measuring an upper surface of the workpiece and a surface level of a material deposited on the upper surface of the workpiece until the surface level of the material corresponds to a specific thickness of the material; and

a deposition system for depositing the material on the workpiece to the specific thickness as monitored by the sensing system.

2. The system of claim 1 wherein the deposition system is a spin-coating deposition system.

3. The system of claim 2 wherein the sensing system includes a sensor for both measuring the upper surface of the workpiece and for monitoring the surface level of the material deposited on the upper surface of the workpiece.

4. The system of claim 2 wherein the sensing system includes a first sensor for measuring the upper surface of the workpiece and a second sensor for monitoring the surface level of the material deposited on the upper surface of the workpiece.

5. The system of claim 1 wherein the deposition system is a stereolithographic deposition system.

6. The system of claim 5 wherein the sensing system includes a sensor for both measuring the upper surface of the workpiece and for monitoring the surface level of the material deposited on the upper surface of the workpiece.

7. The system of claim 5 wherein the sensing system includes a first sensor for measuring the upper surface of the workpiece and a second sensor for monitoring the surface level of the material deposited on the upper surface of the workpiece.

8. The system of claim 1 wherein the workpiece is a semiconductor wafer.

9. A selective deposition system for depositing a material at selective locations on a previously formed workpiece, comprising:

a controller;

a platform for moveably supporting in a Z direction the workpiece during a layer by layer deposition of the material at the selective locations on the workpiece;

a reservoir for retaining the material and submerging the platform and the workpiece during the layer by layer deposition;

an X/Y scanning laser responsive to the controller for exposing a portion of the material corresponding to the selective locations for a current deposition layer about the workpiece; and

at least one sensing system responsive to the controller for determining a workpiece surface level when the workpiece is supported by the platform and for determining a surface level of the material formed on the workpiece.

10. The system of claim 9 wherein the at least one sensing system is further configured for determining a material level within the reservoir, the material level corresponding to a surface level of the material formed on the workpiece.

11. The system of claim 10, wherein the controller is further configured to orient the workpiece near the material level for initializing the layer by layer deposition of the workpiece.

12. The system of claim 9 wherein the controller is further configured to continuously control the platform and the laser while monitoring the second sensing system until the material

on the workpiece corresponds to a specific thickness of the material.

13. The system of claim 9 wherein the at least one sensing system comprises a first sensing system and a second sensing system with each including at least one transmitter and at least one receiver.

14. The system of claim 9 wherein the workpiece is a semiconductor wafer including at least one semiconductor die.

15. The system of claim 14 wherein the material formed on the semiconductor wafer is formed on at least an active surface.

16. A method for selectively depositing a material on a workpiece, comprising:

securing a workpiece to a platform;

measuring a level of a top surface of the workpiece to determine a starting point for depositing an unconsolidated material thereon;

depositing the unconsolidated material on the workpiece;

measuring a level of an upper surface of the unconsolidated material as deposited on the workpiece to determine a thickness of the material on the workpiece from the respective levels of the top surface of the workpiece and the level of the upper surface of the material;

consolidating at least a portion of the unconsolidated material according to a defined pattern on the workpiece when the thickness of the material on the workpiece does not exceed a preselected thickness; and

repeating the depositing, measuring and consolidating of the upper surface of the material until the thickness of the material corresponds to the preselected thickness.

17. The method of claim 16 wherein the depositing comprises spin-coating the workpiece with at least a portion of the material.

18. The method of claim 16 wherein the depositing comprises coating the workpiece with the unconsolidated material the consolidating comprises exposing selected portions of the unconsolidated material over the workpiece to form the material on the workpiece.

19. The method of claim 18 wherein the coating comprises submerging the platform and the workpiece attached thereto into a volume of the unconsolidated material.

20. The method of claim 18 wherein the coating comprises applying the unconsolidated material to the workpiece with a recoater blade across an upper surface of the material on the workpiece.

21. The method of claim 16 wherein the measuring a level of a top surface of the workpiece, comprises:
transmitting a signal from a transmitter toward the top surface of the workpiece;
receiving the signal at a receiver as reflected by the top surface of the workpiece; and
calculating the level of the top surface upon which the at least a portion of the material is deposited.

22. The method of claim 16 wherein the measuring an upper surface of the material as deposited on the workpiece, comprises:
transmitting a signal from a transmitter toward the upper surface of the material;
receiving the signal at a receiver as reflected by the upper surface of the material; and
calculating the thickness of the material as deposited on the workpiece to determine the thickness of the material on the workpiece.

23. A method for fabricating a semiconductor assembly, comprising:

measuring a level of a top surface to determine a deposition starting point of at least one semiconductor die integral with a semiconductor wafer;

depositing a layer of an encapsulant material in an unconsolidated form beginning at the deposition starting point on the at least one semiconductor die;

measuring an upper surface of the layer of the encapsulant material as deposited on the at least one semiconductor die to determined a thickness of the material on the at least one semiconductor die;

consolidating at least a portion of the encapsulant material in the unconsolidated form according to a defined pattern on the at least one semiconductor die when the thickness of the material on the at least one semiconductor die does not exceed a preselected thickness; and

repeating the depositing, measuring and consolidating of another layer of the encapsulant material over a previous layer until the thickness of the encapsulant material is substantially equal to the predetermined thickness.

24. The method of claim 23 wherein the depositing comprises spin-coating the semiconductor wafer with at least a portion of the encapsulant material in an unconsolidated form.

25. The method of claim 23 wherein the depositing comprises:

coating the semiconductor wafer with the encapsulant material in an unconsolidated form; and

exposing selected portions of the encapsulant material over the semiconductor wafer to form the layer of the encapsulant material on the at least one semiconductor die.

26. The method of claim 25 wherein the coating comprises submerging the semiconductor wafer into a volume of the encapsulant material in an unconsolidated form.

27. The method of claim 25 wherein the coating comprises applying the uncured portion of the encapsulant material to the semiconductor wafer with a recoater blade across an upper surface of the encapsulant material on the semiconductor wafer.

28. The method of claim 23 wherein the measuring a level of a top surface of the at least one semiconductor die, comprises:

transmitting a signal from a transmitter toward the top surface of the at least one semiconductor die;

receiving the signal at a receiver as reflected by the top surface of the at least one semiconductor die; and

calculating the level of the top surface upon which the at least a portion of the encapsulant material is deposited.

29. The method of claim 23 wherein the measuring an upper surface of the encapsulant material as deposited on the at least one semiconductor die, comprises:

transmitting a signal from a transmitter toward the upper surface of the encapsulant material;

receiving the signal at a receiver as reflected by the upper surface of the encapsulant material; and

calculating the thickness of the encapsulant material as deposited on the at least one semiconductor die to determine the thickness of the material on the at least one semiconductor die.